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DOUBLE-BASE TRANSFORMATIONS--LANGUAGE CURRICULUM II, STUDENT VERSION.

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A MANUAL ON DOUBLE-BASE TRANSFORMATIONS WAS PREPARED FOR STUDENTS IN THE EIGHTH-GRADE LANGUAGE CURRICULUM. THE MANUAL WAS A STUDY GUIDE ACCOMPANYING UNITS OF INSTRUCTION ON CONJUNCTIVE AND EMBEDDING TRANSFORMATIONS. APPROPRIATE INSTRUCTIONS AND DIAGRAMS WERE INCLUDED WITH STUDENT EXERCISES KEYED TO THE MANUAL PREPARED FOR TEACHERS (ED 010 156). (WN)

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OREGON CURRICULUM STUDY CENTER

DOUBLE-BASE TRANSFORMATIONS

Language Curriculum II
Student Version

The project reported herein was supported through the Cooperative Research Program of the Office of Education, U. S. Department of Health, Education, and Welfare.

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CONJUNCTIVE TRANSFORMATIONS

You have learned how single kernel sentences can be changed to form other kinds of sentences which are not kernels. The changes involved moving words about, adding words, and sometimes replacing words of the kernels with other words. You perhaps remember that we called such operations single-base transformations. You have learned how to change kernel sentences to passive sentences and how to turn them into various kinds of questions. All of these are examples of single-base transformations.

In English we also have an entirely different kind of transformation in which two kernel sentences are transformed into a single sentence that is not a kernel. We will call this second kind of transformation complex or double-base. A very large number of the sentences of our language are the result of this kind of transformation. One of the most common examples is the conjunctive transformation.

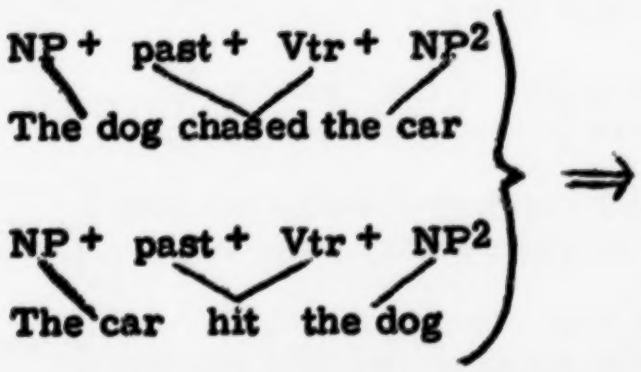
Young children say things like "The dog chased the car. The car hit the dog." or "Jane sees Dick. Dick sees Jane.", all of which are kernel sentences. But you would surely combine these pairs of kernel sentences into one sentence. You can probably think of many ways to do this. Perhaps the easiest way is simply to put the two together with a joining word. And is such a word. It is called a conjunctive word or a conjunction. Conjunction means joining, and this is what we often do with kernel sentences, such as those above, that are related so that they seem to belong together. You might say, for instance

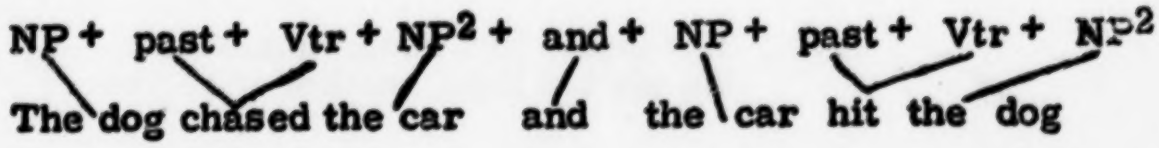
The dog chased the car and the car hit the dog.

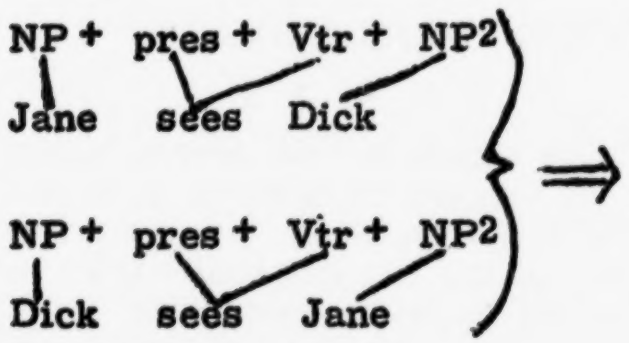
or

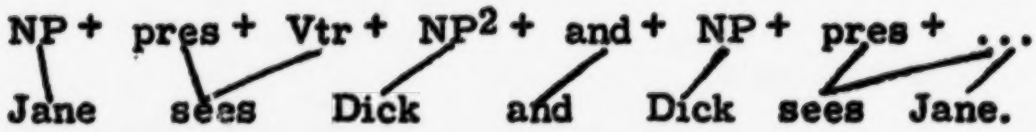
Jane sees Dick and Dick sees Jane.

We could write the linguistic symbols for the kernel sentences and for the combined sentences to show what has happened. They would look like this:









These are conjunctive transformations of kernel sentences. We can call them sentence conjunctions. In both of these transformations the conjunction and was used. And is called a coordinating conjunction because it joins things that are alike, such as two kernel sentences. Other coordinating conjunctions are but, or, nor, for, yet, and so.

Exercise 1:
Transform the following pairs of sentences by joining them with appropriate conjunctions. In other words perform a sentence conjunction.

1. I called Mary
   She came home quickly. } ⇒

2. Linda whispered in class
   The teacher scolded her. } ⇒

3. The car shot forward
   Hank stepped on the starter. } ⇒

4. John became an artist.
   Phillip became a musician. } ⇒

5. Helen cooked the dinner.
   Barbara washed the dishes. } ⇒

6. Kennedy defeated Nixon.
   The vote was close. } ⇒

7. We will see you at the reunion.
   We will see you at the dinner. } ⇒

8. Arthur had weighed seventy pounds.
   Bill had weighed eighty pounds. } ⇒

9. The wind was blowing hard.
   We took the kites to the hill quickly. } ⇒

10. The dance has been successful.
    We should have another next year. } ⇒

11. The house was shaking.
We ran outside. } ⟹

Look now at the sentences which you have just combined or transformed by a conjunctive transformation. Do they all have the same kind of verbs? Are there any Be verbs? Are there any linking verbs? What other kinds are there? Some of the sentences have NP^2 after transitive verbs. Which ones? What are the verbs in 9 followed by? Some of the sentences have predicates. Which ones? Does it seem to make any difference what kind of sentence we join with a conjunction? Apparently any two kernel sentences can be joined in this way. If we let S stand for a kernel sentence and and stand for any conjunction, we can write the rule for the transformation in this way.

$$\left.\begin{matrix} S^1 \\ S^2 \end{matrix}\right\} \text{----> } S^1 + \underline{\text{and}} + S^2$$

In all of the sentences we have been talking about two kernel sentences have been joined by a conjunction. This is the simplest of all complex transformations, so simple that it hardly needs mentioning. It is included simply because it is one way we change kernel sentences into more complicated sentences.

Subject Conjunctions

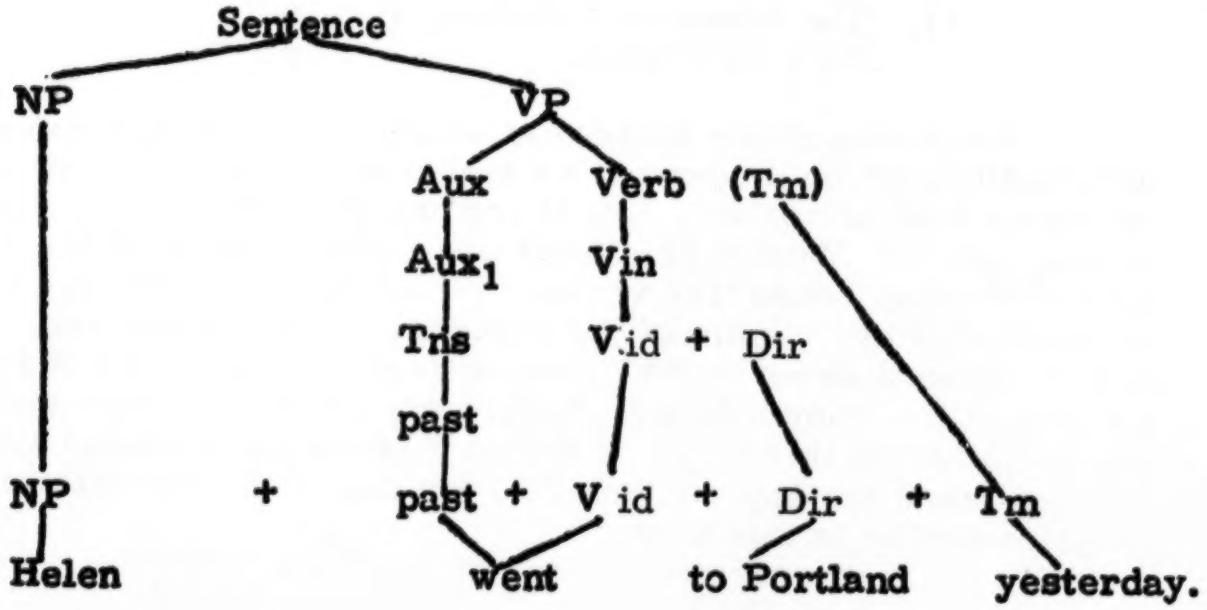
Let us look at another kind of conjunctive transformation, a more complicated one. This will show us still another way by which kernel sentences become more complicated. For instance, would you say in conversation "Helen went to Portland yesterday. Bill went to Portland yesterday." or would you say "Helen and Bill went to Portland yesterday."? Undoubtedly you would prefer the latter. The first two sentences are kernel sentences. The third one isn't. Can you, however, see a relation between 1 and 2 and 3?

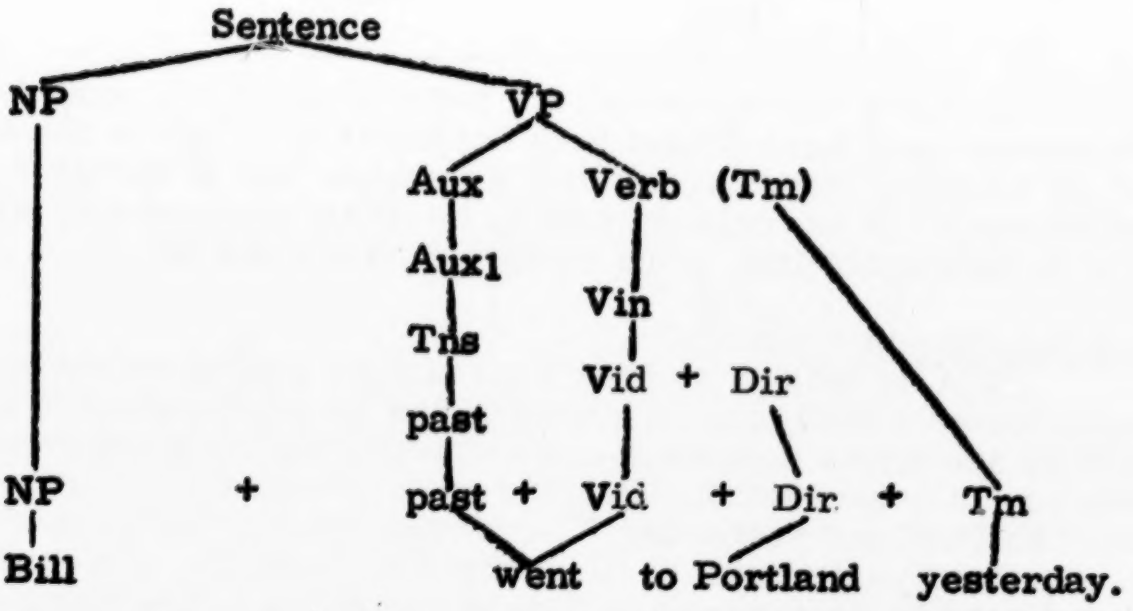
1. Helen went to Portland yesterday.
2. Bill went to Portland yesterday.
3. Helen and Bill went to Portland yesterday.

Do you have a feeling that 3 is the result of something having happened to 1 and 2? How did 1 and 2 become 3?

In what ways do the two original sentences differ? In what ways are they alike? Let us construct a branching diagram for each and bring down the strings which derive from them.

See following page.





(Note: We did not break the NP down, since we are concerned with the entire NP and not with any one of its parts.)

We can see that both sentences have the same branching diagram and the same string of linguistic symbols. All the elements are alike in the diagrams but the subjects in the final kernels are different. They go back to the same origin in the diagram but are different in the final form.

Now what happened when the two kernel sentences were joined to form sentence 3?

What has been taken from sentence 2 and placed in sentence 1?

What else has been added?

To distinguish between the NP's in the two sentences let's call the subject NP in Sentence 1, NP_1 and the subject NP in Sentence 2, NP_2.* Then the linguistic string for the new sentence will be:

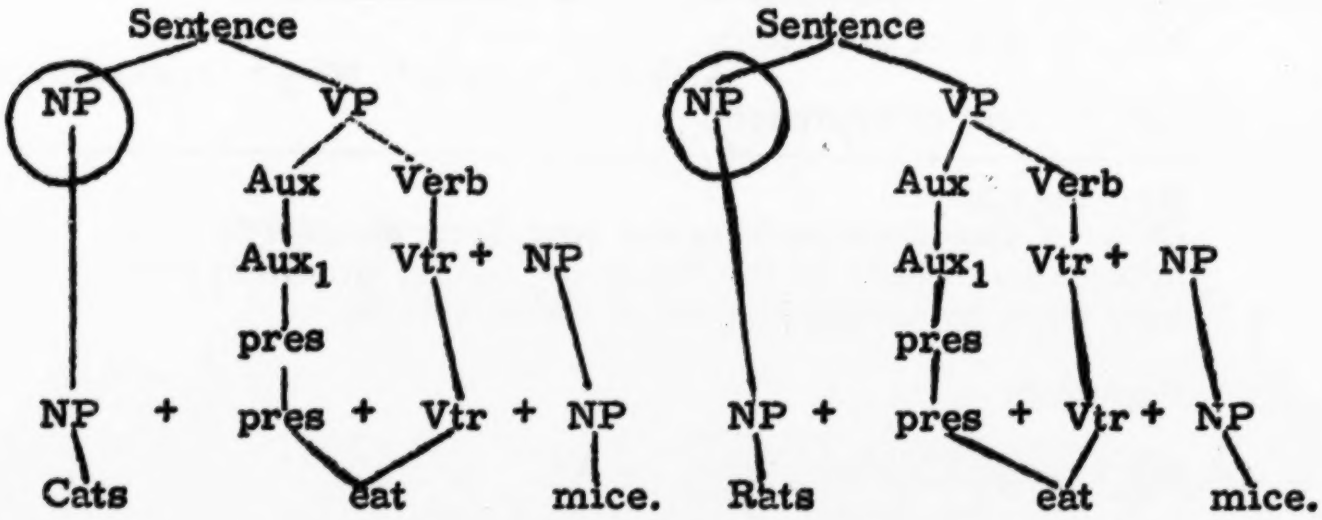
NP_1 + and + NP_2 + past + Vid + Dir + Tm

Helen and Bill went to Portland yesterday.

*Don't confuse NP_1 and NP_2 with NP^1 and NP^2. NP_1 and NP_2 are used simply to show that they come from different sentences.

Exercise 2:
Try to perform this same kind of conjunction with the following pairs of sentences. Construct the branching diagrams for each pair and circle in the diagram the point the unlike elements derive from.

Example: Cats eat mice } ⇒ Cats and rats eat mice.
Rats eat mice }



1. The boy walked in the park. }
   The girl walked in the park. }

2. Fred flunked the exam. }
   Mary flunked the exam. } ⇒

3. The deer have escaped from the zoo. }
   The elk have escaped from the zoo. } ⇒

4. The dog howled all night. }
   The cat howled all night. } ⇒

5. Glenn was orbiting the earth. }
   Carpenter was orbiting the earth. } ⇒

What two things are true about each of these pairs of sentences?

1) They are alike in every respect except the subject NP

2) The elements which are different--the subject NP's--have the same symbol in the linguistic string and derive from the same place in the branching diagram.

So we can see that when these two things are true about two kernel sentences it is possible to perform a conjunctive transformation by adding the NP of one sentence to the NP of the other sentence and joining them by a conjunction.

Does it make any difference what the rest of the sentence is, as long as it is the same in both kernels? Since we are interested

only in the NP in this transformation, we can symbolize the two kernels in this way:

NP_1 + rest of sentence

NP_2 + rest of sentence
(where rest of sentence is the same in both cases)

and the rule for the transformation would look like this:

NP_1 + rest of sentence
NP_2 + rest of sentence
$\Rightarrow$ NP_1 + and + NP_2 + rest of sentence

Exercise 3:
On your paper write first the linguistic strings for the sentences in each of the following pairs, and then combine them by a conjunctive transformation.

Example:

NP + past + Vid + Dir
The Ford roared up the hill

NP + past + Vid + Dir
The Buick roared up the hill

$\Rightarrow$

NP + and + NP + past + Vid + Dir
The Ford and the Buick roared up the hill.

A. 1. The azelas are blooming.
The rhodedendrons are blooming.

2. The calico cat sat on the table.
The gingham dog sat on the table.

3. George built a rocket.
Bill built a rocket.

4. The pilot made preparations.
The stewardess made preparations.

5. Jack fell down.
Jill fell down.

6. Tweedledum fought a battle.
Tweedledee fought a battle.

7. Clara climbed the mountain.
   Heidi climbed the mountain.

8. Buttercups grow wild in Oregon.
   Daisies grow wild in Oregon.

B. 1. The class gave him a bad time.
   The teacher gave him a bad time.

2. The owl has gone to sea.
   The pussycat has gone to sea.

3. Bud will work in the beanfields in the summer.
   Will will work in the beanfields in the summer.

4. Mutt was a comic strip character.
   Jeff was a comic strip character.

5. An elephant had escaped last night.
   A tiger had escaped last night.

6. The planes have been going to Eugene.
   The trains have been going to Eugene.

7. Breakfast will cost seventy-five cents.
   Lunch will cost seventy-five cents.

8. The stars were shining in the sky.
   The moon was shining in the sky.

(What happens to the verbs in 2, 4, and 8? Why? Does anything else happen in 4?)

We have now used a conjunctive transformation to combine two sentences which are alike in every way except in the subject NP in the sentence strings. We call this process a subject conjunction.

Verb Conjunctions

Are there other kinds of conjunctive transformations? In what ways are the following pairs of sentences alike? In what ways are they different?

1. Mary ran.
   Mary jumped.

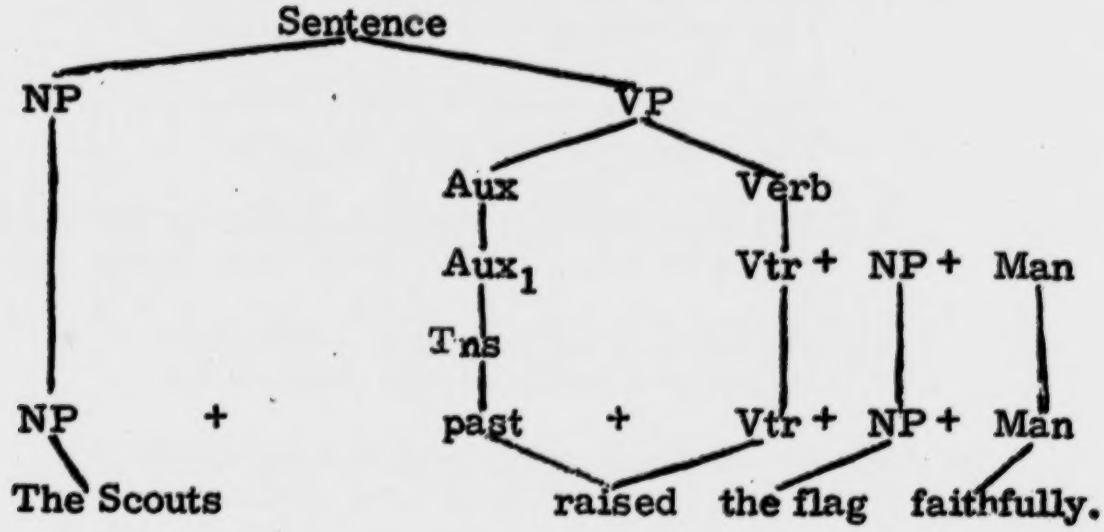
2. The tiger growled.
   The tiger roared.

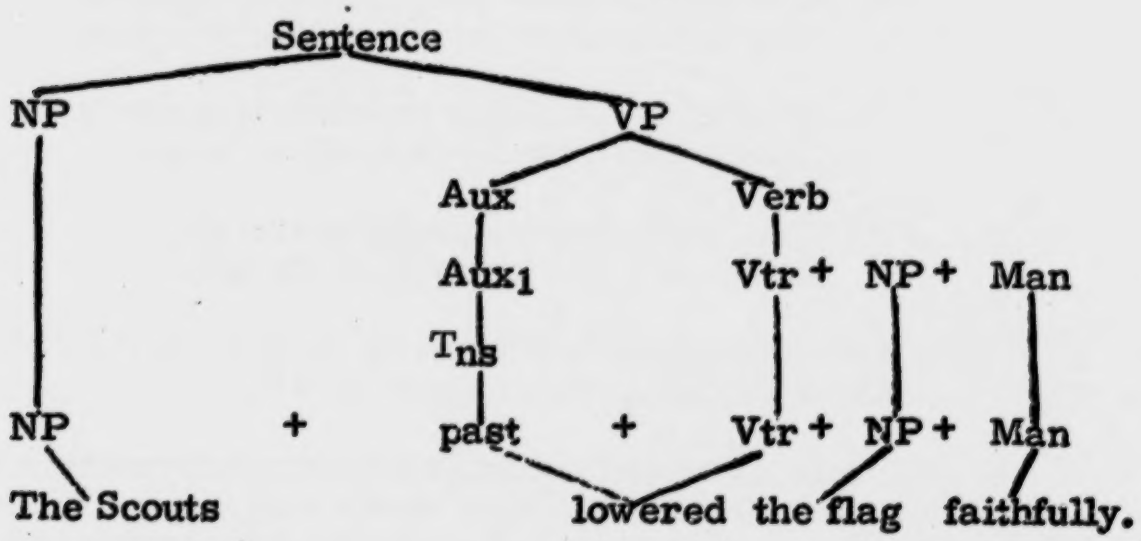
3. The wind whistled in the oak tree.
   The wind sang in the oak tree.

4. Sarah washed the dishes.
   Sarah dried the dishes.

5. The Scouts raised the flag faithfully.
   The Scouts lowered the flag faithfully.

Can you combine each of the pairs to make a third sentence? Branching diagrams for the last pair of sentences should look like this:

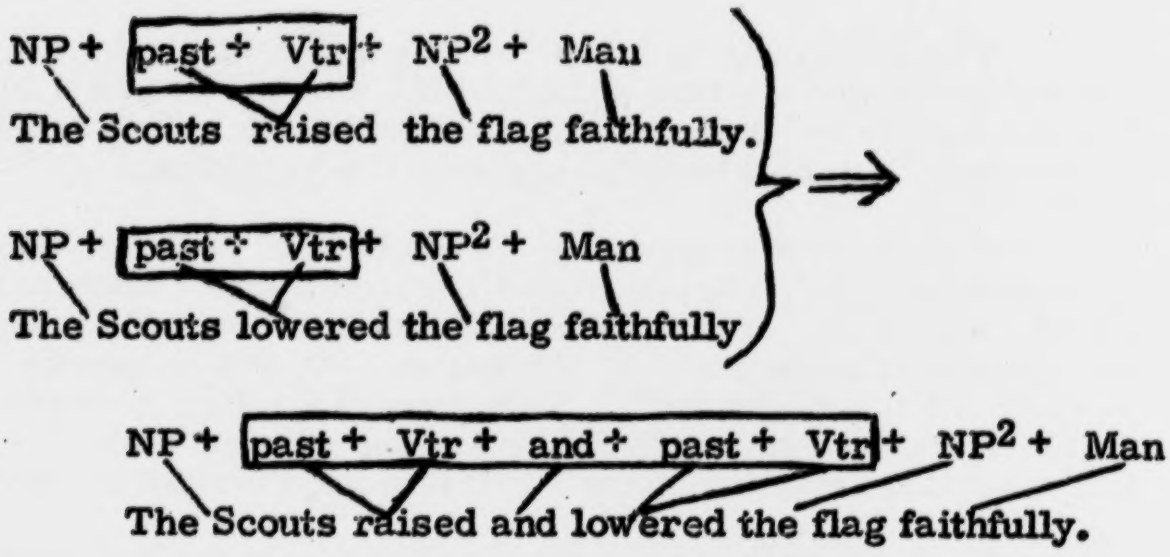




Are the diagrams alike? Are the sentence strings the same? What words are different? Do these Vtr's derive from the same place in the branching diagram? Since the sentences are alike except for the verbs can we combine them to form one sentence? For instance can we say "The Scouts raised and lowered the flag faithfully?"

What two things did we do in the operation?

We took the Vtr from the second sentence and joined it by and to the Vtr of the first sentence. We did this because the Vtr's are the unlike elements which are involved in the conjunction. This is another kind of conjunctive transformation, the verb conjunction. If we call the verb in the first sentence Vtr_1 and the verb in the second, Vtr_2, we can write the linguistic strings for the transformation in this way:


NP + past + Vtr + NP2 + Man
The Scouts raised the flag faithfully.
NP + past + Vtr + NP2 + Man
The Scouts lowered the flag faithfully
NP + past + Vtr + and + past + Vtr + NP2 + Man
The Scouts raised and lowered the flag faithfully.

We have drawn boxes around the elements involved in the conjunction.

Exercise 4:
Construct branching diagrams side by side for the following pairs of sentences and answer these questions for each pair.

a. Are the diagrams alike?
b. Are the sentence strings alike?
c. What elements are different?
d. Do the unlike elements in the sentences derive from the same point in the branching diagram?
e. Is it possible to join the two sentences in a verb conjunction?
f. If so write the transformed sentence and make the linguistic string for it.

1. George was a fool.
   George is a fool.

2. Frannie became a cheer leader.
   Frannie remains a cheer leader.

3. Mitchell became the president.
   Mitchell saw the president.

4. The swallows dip over the field.
   The swallows soar over the field.

5. Wilfred was the lieutenant.
   Wilfred hit the lieutenant.

6. The cat has clawed the tree.
   The cat has scratched the tree.

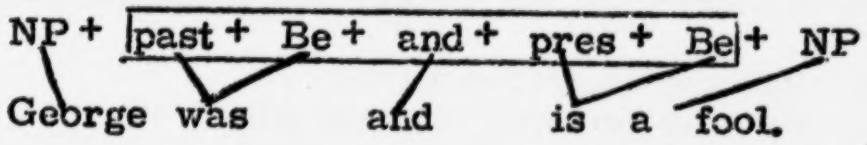
Which sentences were you able to join by a verb conjunction? What was true of the verbs in each of these pairs? What sentences did you think could not be joined? Were the verbs in each of these pairs the same kind of verb? That is, did they derive from the same place in the branching diagram?

The sentences in 3 have a Vlnk and a Vtr. Hence, they do not derive from the same point and the sentence can not be transformed simply by joining the two unlike words. That is why we cannot say "Mitchell became and saw the president."

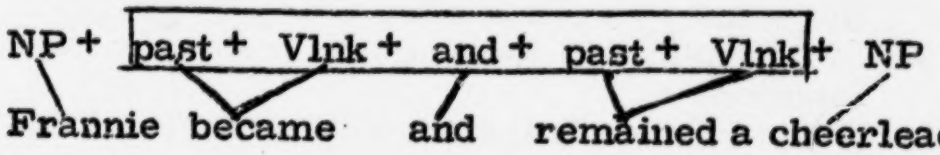
Now look at sentence 5. What kind of verb do you find? Do Be verbs and Vtr's derive from the same point? They can not be joined, therefore, in a verb conjunction, although the rest of the two sentences appears to be the same. We would not say "Wilfred was and hit the lieutenant." This can not be done because "lieutenant" in the first sentence is the NP following a Be verb and "lieutenant" in the second sentence is the NP following a transitive verb.

Note: In writing the string of symbols for the transformed sentences in 1, 2, and 6, it was necessary to repeat the tense sign before each verb.

For instance in 1 we wrote

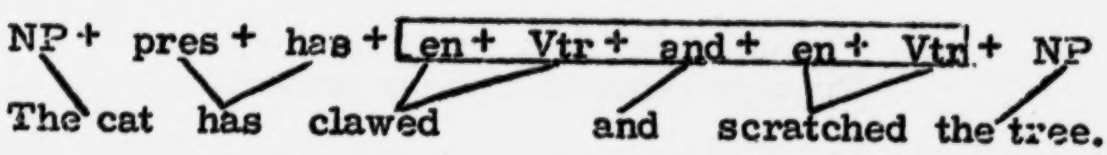


And in 2 we wrote



Why do we repeat the tense sign?

In the transformed string for 6 we wrote:



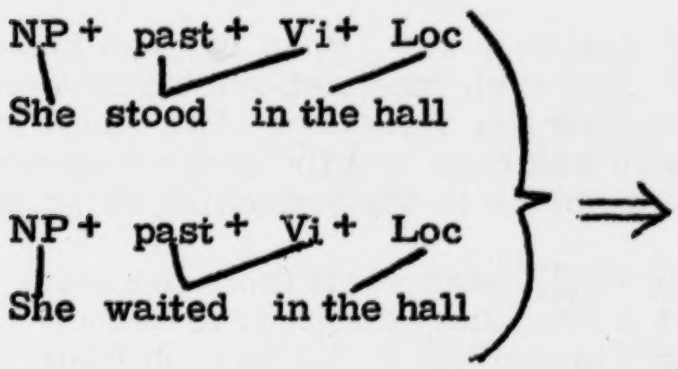
Why do we write the tense sign only once here? Why do we write en before each Vtr?

Exercise 5:
Write the linguistic strings for the following pairs of sentences and transform each pair by a verb conjunction.

Example:

See following page.

She stood in the hall.
She waited in the hall.



NP + past + Vi + and + past + Vi + Loc
She stood and waited in the hall.

1. The guide encouraged the hikers.
   The guide instructed the hikers.

2. Flowers wither in the desert.
   Flowers die in the desert.

3. Gerald stole the ring.
   Gerald hid the ring.

4. The tourist has caught the salmon.
   The tourist has weighed the salmon.

5. The plane bounced above the river.
   The plane shook above the river.

6. The worm wiggled on the tomato plant.
   The worm squirmed on the tomato plant.

7. The plane crashed in the field.
   The plane burned in the field.

8. The cowboys were roping the steer.
   The cowboys were tying the steer.

Now, let's look at another pair of sentences.

NP + Vin
Bozo ran

NP + Vtr + NP
Bozo kicked the ball

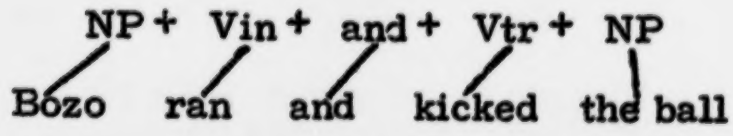
What is alike in each?

What is different?

Do you think it would be possible to perform a verb conjunction on this pair?

Could we, for instance, say "Bozo ran and kicked the ball?" Why is this possible? The verb conjunctions we have performed so far have occurred with pairs of sentences alike in all but one element and that element in each sentence had the same linguistic symbol and came from the same place in the branching diagram.

Do Vin and Vtr + NP branch off from the same point? (You may have to construct a branching diagram to answer this question.) You will find that both Vin and Vtr + NP branch from the same point, V. Therefore, it is possible to combine our two sentences above into a third:



joining the elements that are different with and. But it is important to notice that we joined not only the Vin and Vtr, but that we included the NP following the Vtr in the conjunction because it also branches from V. In other words we included everything below the common point V.

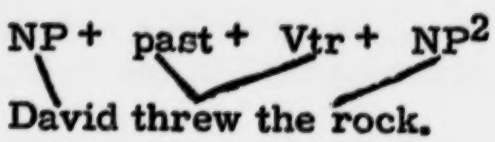
Still another possibility occurs in sentences like this pair:

David threw the rock.
David hit Goliath.

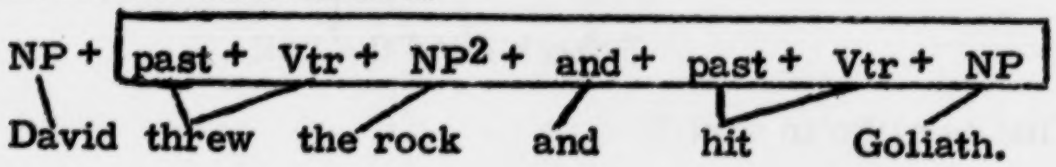
What elements are alike in these two sentences?

What are different?

The linguistic strings for this pair of sentences look the same.



All the elements are derived from the same point in the diagram, although in the sentences the Vtr's and the object NP's are different. Therefore the unlike elements may be joined in a verb transformation. Notice again that the Vtr's must keep their NP's with them in the transformation:



Let us take one more example.

NP + past + Vin + Man

The flowers grew quickly

NP + past + Vin + Man

The flowers bloomed profusely.

The linguistic strings for these sentences are the same. But in the sentences themselves the verbs and the manner adverbs are different. Both must, therefore, be involved in the conjunction. We write:

NP + past + Vin + Man + and + past + Vin + Man

The flowers grew quickly and bloomed profusely.

Conclusion:

1. Verb conjunctions are possible if
   a) Two sentences are alike in every respect except the verb, and
   b) The verbs derive from the same point in the branching diagram.
2. It is necessary to find a common point from which both verbs derive. Sometimes this may be VP and everything below VP will thus be included in the conjunction.
3. Only those parts of the Verb Phrase which are different in the sentences are involved in the conjunction. (Remember that sometimes there will be words in the verb phrase which look alike but which may actually be different because they derive from different points in the diagram.)

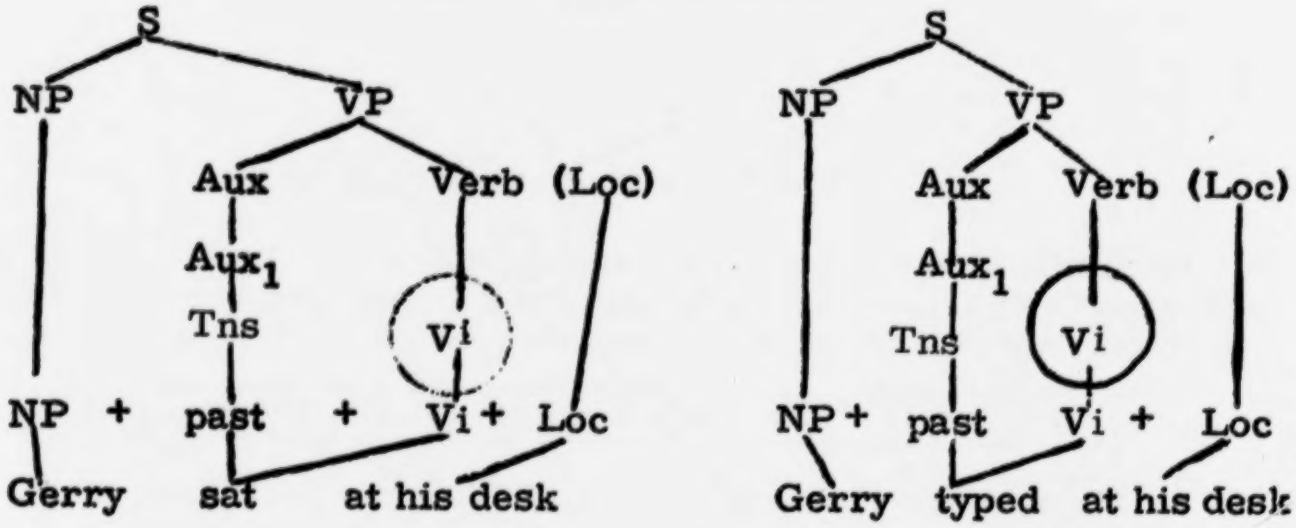
When these conditions exist we can write the following general rule to cover verb transformations. We will use (...) to indicate the part of the sentence not involved.

$$\left.\begin{array}{l} \ldots + VP_1 \\ \ldots + VP_2 \end{array}\right\} \Rightarrow \ldots + VP_1 + \text{and} + VP_2$$

Exercise 6:
Construct branching diagrams for the following pairs of sentences. Circle the point in the diagram from which unlike elements derive. Then transform the pairs by verb conjunctions.

Example:

Gerry sat at his desk.
Gerry typed at his desk.



Gerry sat and typed at his desk.

A. 1. Rain fell in sheets.
Rain flooded the fields.

2. The face appeared at the window.
The face remained at the window.

3. Smoke rose to the ceiling.
Smoke filled the room.

4. Mac saw the accident last night.
Mac reported the accident last night.

5. Mary was the best actress.
Mary is the best actress.

6. The Model T stood in the yard.
The Model T rusted in the yard.

B. 1. The car rolled down the hill.
The car stopped in the field.

2. The messenger parked his bicycle.
The messenger went into the building.

3. Roger grew tall.
Roger grew corn.

4. The cat glanced at the canary guiltily.
The cat strolled out nonchalantly.

5. The cook prepared cocoa.
The cook toasted muffins.

6. Ruff grabbed the bone quickly.
Ruff buried the bone quickly.

Conjunctions Formed with Other Parts of the VP

Object Conjunctions

We have seen that object NP's are included with their transitive verbs when the transitive verbs are involved in a verb conjunction.

1. Mary poured the milk.
Mary cut the cake. } ⇒ Mary poured the milk and cut the cake.

If the object NP's are the same in two sentences in which a verb conjunction is being carried out, what happens?

2. Bridget stuffed a turkey.
Bridget roasted a turkey. } ⟹ ?

But if only the object NP's are different, what part of the VP is involved in the conjunction?

3. Mrs. Plushbottom poured coffee.
Mrs. Plushbottom poured tea. } ⟹ ?

We can say, then, that there are three possibilities for object NP's in forming conjunctive transformations.

1) The object NP's can be part of the general VP conjunction, remaining attached to their Vtr's.

$$\left.\begin{array}{l}\ldots\ Vtr_1\ NP^2\\ \ldots\ Vtr_2\ NP^2\end{array}\right\} \Rightarrow \ldots + Vtr_1 + NP^2 + \text{and} + Vtr_2 + NP^2$$

2) The object NP's of two different verbs may be the same. They would, then, be part of the sentence that wasn't involved in the conjunction, as in the sentences about Bridget above. Only the Vtr's without the NP's would be included.

$$\left.\begin{array}{l}\ldots Vtr_1 \ldots\\ \ldots Vtr_2 \ldots\end{array}\right\} \Rightarrow \ldots\ Vtr_1 + \text{and} + Vtr_2 + \ldots$$

3) The object NP's may be the only elements that are different in a pair of sentences and would then be all that is involved in the conjunction, as in 3 above.

$$\left.\begin{array}{l}\ldots NP_1{}^2\\ \ldots NP_2{}^2\end{array}\right\} \Longrightarrow \ldots + NP_1{}^2 + \text{and} + NP_2{}^2$$

Predicate Conjunctions

What part of the sentence string are each of the unlike elements in the following pairs of sentences?

1. Mary Jane will be cheerleader next year.
   Mary Jane will be class secretary next year.

2. The oranges taste sweet.
   The oranges taste juicy.

3. His sister was pretty.
   His sister was charming.

4. Some people become traitors.
   Some people become spies.

5. The teen canteen will be in front of the school.
   The teen canteen will be across the street.

6. Our house was on the right.
   Our house was up the hill.

Try to perform a conjunctive transformation on each pair and then describe what elements are involved in the conjunction. Why is it possible to perform these transformations?

Are the Pr's in each pair of sentences the same kind of Pr?

What happens when there are two different kinds of Pr in a pair of sentences which are alike in every other respect? Can you perform conjunctive transformations on the following pairs by joining the Pr's?

His sister was always pretty.
His sister was always a nurse. } ⇒ ?

George became enthusiastic.
George became a politician. } ⇒ ?

The class was in the bus.
The class was a model of behavior. } ⇒ ?

Why do these transformations using only the Pr's seem ungrammatical? We can write a rule now that shows that when all the elements in the two sentences are alike except for the Pr's, a conjunctive transformation involving both Pr's can take place if the Pr's are the same kind.

$$\begin{matrix}\ldots Pr_1 \\ \ldots Pr_2\end{matrix} \Rightarrow \ldots Pr_1 \quad \text{and} \quad Pr_2$$

Exercise 7:
Transform the following pairs of sentences by predicate conjunctions whenever possible.

Example:

The chrysanthemums were yellow.
The chrysanthemums were white. } ⇒ The chrysanthemums were yellow and white.

1. The child was quiet yesterday.
   The child was thoughtful yesterday.

2. Peter became violent.
   Peter became abusive.

3. The giant cactus felt rough.
   The giant cactus felt prickly.

4. Our neighbor is a farmer.
   Our neighbor is brave.

5. The hallway seemed dark usually.
   The hallway seemed damp usually.

6. The bishop is a hypocrite.
   The bishop is a liar.

7. Jonathon remained loyal.
   Jonathon remained a friend.

8. Mice have been in the basement.
   Mice have been in the attic.

Adverb Conjunctions--(Tm), (Man), (Loc), (Dir)

What part of the sentence string are the unlike elements in the following pairs of sentences? Can you perform conjunctive transformations on them?

The flowers grew rapidly.
The flowers grew luxuriously.

Our grandparents lived peacefully.
Our grandparents lived happily.

You will hear from me now.
You will hear from me then.

He had been arrested on Saturday.
He had been arrested on Sunday.

We will fight them in the towns.
We will fight them on the beaches.

We saw them yesterday.
We saw them the day before.

Our rockets fly to the moon.
Our rockets fly to Mars.

Can adverbs of different kinds be joined by a conjunction in a conjunctive transformation? Can we say

Our grandparents lived peacefully and now?

or

We will fight them in the towns and on Saturday?

The linguistic picture of what happens in an adverb conjunction will show that when two sentences are alike in every respect except for adverbs, and when those adverbs are of the same kind, an adverb conjunction can take place.

$$\left.\begin{matrix}\ldots Tm_1 \\ \ldots Tm_2\end{matrix}\right\} \Rightarrow \quad \ldots Tm_1 \text{ and + } Tm_2$$

$$\left.\begin{matrix}\ldots Man_1 \\ \ldots Man_2\end{matrix}\right\} \Rightarrow \quad \ldots Man_1 \text{ and + } Man_2$$

$$\left.\begin{matrix}\ldots Loc_1 \\ \ldots Loc_2\end{matrix}\right\} \Rightarrow \quad \ldots Loc_1 \text{ and + } Loc_2$$

$$\left.\begin{matrix}\ldots Dir_1 \\ \ldots Dir_2\end{matrix}\right\} \Rightarrow \quad \ldots Dir_1 \text{ and + } Dir_2$$

Exercise 8:
Copy the following pairs of sentences on your paper. For each pair list the adverbs and indicate what kind they are. When possible transform the sentences by performing adverb conjunctions.

Example:

The Swiss live peacefully in the mountains.
The Swiss live happily in the mountains. } ⇒

The Swiss live peacefully and happily in the mountains.

peacefully--Man
in the mountains--Loc
happily--Man

1. The rats chewed the woodwork noisily.
   The rats chewed the woodwork diligently.

2. Weeds grew in the streets.
   Weeds grew in the yards.

3. The manager will meet me tomorrow.
   The manager will meet me the next day.

4. The children ran to the school.
   The children ran home.

5. The bell rang in the tower.
   The bell rang all night.

6. The technician removed the appendix carefully.
   The technician removed the appendix neatly.

Exercise 9:
Copy the following pairs of sentences on your paper. List the elements that are different for each pair. Indicate what they are in the sentence string. Write a conjunctive transformation for each pair.

Example:

Larry greased the Honda.
Larry oiled the Honda. } ⇒ Larry greased and oiled the Honda

greased--Vtr
oiled--Vtr

We will be here.
We will be there. } ⇒ We will be here and there.

here--loc
there--loc

A. 1. Miss Muffit was eating curds.
Miss Muffit was eating whey.

2. The small boy collected Tiger Swallowtails.
The small boy mounted Tiger Swallowtails.

3. The police followed the trail.
The police caught the criminal.

4. Betsy did her work neatly.
Betsy did her work efficiently.

5. Claude will be Romeo.
Claude will be Hamlet.

6. My dachshund stays in the house.
My dachshund stays in the yard.

7. The doctor has been in.
The doctor has been out.

B. 1. The injured leg turned black.
The injured leg turned blue.

2. Our summer house is white.
Our summer house is yellow.

3. The firetruck roared rapidly down the street.
The firetruck roared noisily down the street.

4. Geoffrey was a good student in school.
Geoffrey is a successful lawyer now.

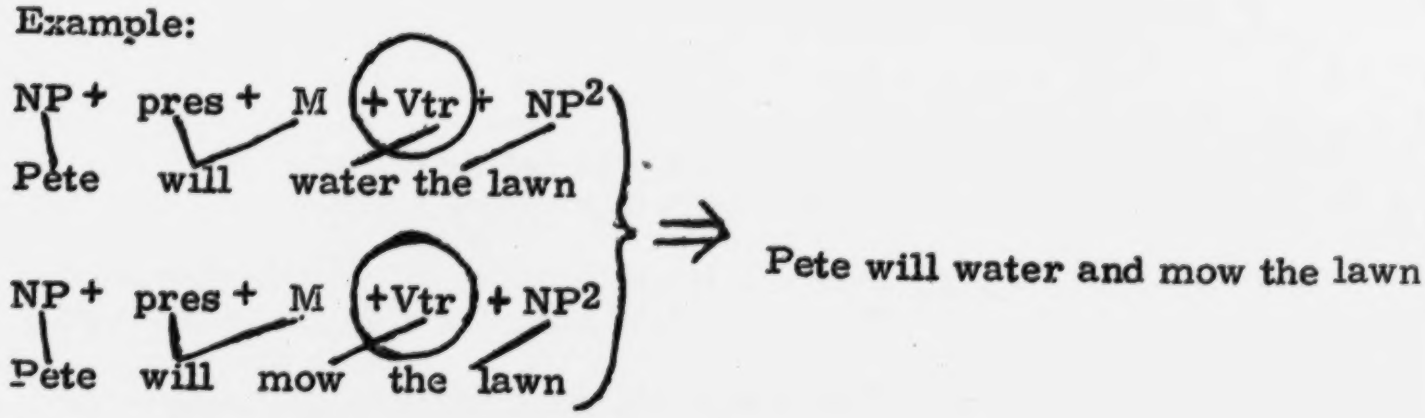
5. Joe checks the furnacesat three o'clock.
   Joe checks the furnaces at nine o'clock.

6. Otto brought milk to the hospital.
   Otto brought milk to the restaurant.

7. Jack has worked hard.
   Jack has played hard.

Review Exercise:
On your paper write first the linguistic strings for the sentences in each pair. Circle the symbols that underlie the words which are not alike. Finally try to perform a conjunctive transformation on each pair. Are there any which can not be joined in this way? Try to tell why.

Example:



A. 1. Susan read the note.
   Susan destroyed the note.

2. Willy Mays stole second.
   Willy Mays stole third.

3. The Nezperces crossed Idaho.
   The Nezperces crossed Montana.

4. The clown shuffled out.
   The clown waved at the crowd.

5. The breakfast will be ham.
   The breakfast will be eggs.

6. The bear climbed the mountain.
   The bear saw the valley.

7. The boy should have worked better.
   The boy should have felt better.

8. John painted the blarney stone.
   Bob painted the blarney stone.

9. The committee is large.
   The committee will be efficient.

10. Cleopatra has come.
Cleopatra has gone.

B. 1. Teddy Roosevelt became president.
Franklin Roosevelt became president.

2. The jaguar yawned lazily.
The jaguar stretched lazily.

3. Casey swung the bat.
Casey hit a homerun.

4. The clerk weighed the package.
The clerk weighed 200 pounds.

5. The picture must have been quaint.
The picture must have been amusing.

6. The company rehearsed The Nutcracker Suite last year.
The company presented The Nutcracter Suite last year.

7. No one remained in the streets.
No one remained in the stores.

8. The army was following the Sioux.
The army was attacking the Sioux.

9. The cactus became dry.
The cactus died.

10. FDR became president in 1933.
FDR served for four terms.

Remember:

1. Conjunctive transformations can occur when sentences are identical in every element but one and when the elements which are not identical derive from the same point in the branching diagram.

2. Whole sentences may also be joined.

3. The elements are joined by means of coordinating conjunctions (and, but, for, or, nor, yet, and so.).

EMBEDDING TRANSFORMATIONS

In the conjunctive transformations you have seen how two English kernel sentences can be combined to make a more complex sentence. This was done either by joining entire sentences with conjunctions or by joining parts of two sentences, such as the subject NP's or the verbs. We are now ready to look at still another kind of complex or double-base transformation involving two kernel sentences.

Look at the following groups of sentences and try to see in what way they are related. What has happened to the first two sentences in each group to form the third sentence?

CONSUMER: The milkmaid carried the pail
SOURCE: The pail was empty.
TRANSFORM: The milkmaid carried the pail which was empty.

CONSUMER: I live in the house.
SOURCE: The house is red.
TRANSFORM: I live in the house which is red.

CONSUMER: He visited Steve.
SOURCE: Steve is friendly.
TRANSFORM: He visited Steve who is friendly.

CONSUMER: The cat hissed.
SOURCE: The cat is angry.
TRANSFORM: The cat which is angry hissed.

CONSUMER: The bicycle cost fifty dollars.
SOURCE: The bicycle is fast.
TRANSFORM: The bicycle which is fast cost fifty dollars.

CONSUMER: The teacher assigned a theme.
SOURCE: The teacher is helpful.
TRANSFORM: The teacher who is helpful assigned a theme.

In every case the second sentence (which we will call the source sentence) moved into the first sentence (which we will call the consumer sentence). In a way we can say that the first sentence consumed the second. We will call this operation embedding. It is a kind of transformation. The second sentence was embedded in the first. The source was embedded in the consumer. How did this happen?

Let us notice what kind of sentences all the source sentences are. What kind of verb does each have? What always follows Be? What kind of Pr do we have in each of the source sentences? What linguistic string of symbols would show the form of each of these source sentences? All of the source sentences are of the same type. They are all Be sentences.

Are all of the consumer sentences of the same type? Do they have the same kind of verbs? Is there any part of the consumer sentence which is like the source sentence? Each consumer sentence has an NP that is the same as the NP in the source sentence. It doesn't seem to matter what kind of sentence the consumer sentence is as long as it has a NP which is the same as the subject NP in the source sentence.

Look at the transformed sentences in the groups above. Has the source sentence been changed in any way before it is embedded in the consumer sentence? What has happened in every case to the first NP of the source sentence? How do we determine whether to use who or which to replace the NP? Could it be replaced by that just as well?

Exercise 1:
Copy the following sentences and underline the subject NP's. After each sentence write the word (who, which, that) which we would use to replace the subject NP.

Example: The car is a racer. (which)
The girl is my friend. (who)

1. The book is red.
2. The volcano is dormant.
3. The dance is crazy.
4. The soap is fragrant.
5. The exam was difficult.
6. The teacher was unreasonable.
7. The class was unruly.
8. The child was talented.
9. The mayor was angry.
10. The team will be victorious.
11. The driver had been careless.
12. The boy is shy.

When we replace the first NP with who or which do we have a sentence or a non sentence? (which was empty, which is red, who is his friend, etc.)? Where have the non sentences beginning with which or who been placed in the consumer sentence to form the transformed sentence? In every case the non sentence made from the source was placed immediately after the NP in the consumer sentence.

In what way is the transformed sentence like the consumer sentence? Obviously the transform is like the consumer except that it is bigger because the source has been fed into it. Nothing in the consumer sentence has been replaced.

Exercise 2:
Copy the following sentences and underline the NP in the consumer sentence that is like the NP in the source sentence. Then embed the source sentence (the one on the second line) into the sentence on the first line. Write your transformed sentence after

the double arrow. What do you have to do to the source before you can embed it?

Example:

The president wore braces.
The president was paralyzed. } ⟹

The president who was paralyzed wore braces.

A. 1. The milkmaid carried the pail.
The milkmaid is beautiful. } ⟹

2. The men surveyed the hill.
The hill is steep. } ⟹

3. The boy has a nose.
The nose is large. } ⟹

4. The bridge spans the stream.
The bridge is long. } ⟹

5. The bridge spans the stream.
The stream is wide. } ⟹

B. 1. We watched the fireworks.
The fireworks were spectacular. } ⟹

2. We fished for trout.
The trout were large. } ⟹

3. Clancy won the match.
Clancy is clever. } ⟹

4. The lunch disappeared.
The lunch was delicious. } ⟹

5. He bought a ring.
The ring is cheap. } ⟹

Exercise 3:
This exercise is the reverse of the preceding one. Work back to the two kernel sentences (the source kernel and the consumer kernel) from the following transformed sentences. That is, decide what are the two kernel sentences that produced the result sentences.

Example:

The man who is conceited won the fight.
CONSUMER: The man won the fight.
SOURCE: The man is conceited.

A. 1. The stranger who is tall is running away.
2. The fire was burning the forest which was vast.
3. The dress which was red cost ten dollars.
4. The war which was long ended.
5. The man who is funny runs a store which is little.

B. 1. We saw the play which was funny.
2. She mended the vase which was broken.
3. The rocket which was small carried a mouse.
4. He found a bat which was poisonous.
5. The man who was nervous drove cautiously.

In all of the sentences we have worked with so far our source sentences were of the form NP + Aux + Be + Adj. Now let us expand our embedding by trying to use Be sentences with the other kinds of Pr. (What are the other kinds?) That is, let us now have source sentences like "The boy is outside." and "The truck is a jeep." Let us try to embed sentences of this kind in the following exercise.

Exercise 4:
Copy the following sentences. Embed the sentence on the second line (source) into the sentence on the first line (consumer) and write the transformed sentence after the double arrow. Underline the part that has been embedded.

Example: The boy is big. } ⇒ The boy who is outside is big.
The boy is outside }

A. 1. The child hit the window. } ⇒
The child is outside. }

2. The man hires teenagers. } ⇒
The man is at home. }

3. I have a book. } ⇒
The book is upstairs. }

4. The truck runs badly. } ⇒
The truck is a jeep. }

5. We bought the house. } ⇒
The house is a mansion. }

6. The man seems happy. } ⇒
The man is a father. }

B. 1. The kite flew beautifully. } ⇒
The kite is in the tree. }

2. The cat mewed constantly. } ⇒
The cat is a Siamese. }

3. The woman toured Europe.
   The woman is a teacher. } ⇒

4. We met the doctor.
   The doctor was here. } ⇒

5. You must find the basketball.
   The basketball is on the patio. } ⇒

6. The counselor called Mr. Jones.
   Mrs. Jones is an expert. } ⇒

C. List the Pr's in the source sentences in the exercises above and indicate what kind they are.

Example: The boy is outside.

outside--adv.

Is it possible to write a rule that will say exactly what happens when we embed a Be sentence into another sentence? First we will write the symbols for a Be sentence.

NP + Aux + Be + Pr

How shall we symbolize the consumer sentence? As we have found out, we really have to know very little about it. All we have to know is that it has an NP that is the same as the subject NP of the source sentence. The consumer can be any kind of sentence and the NP can be any NP found in it. Since we are interested only in the NP we can symbolize the sentence in this way:

...NP...

The three dots before and after the NP of course indicate that we don't really care what is on either side of the NP of the consumer sentence.

Now what did we do with these two sentences in the embedding operation?

1. The NP of the source sentence was replaced by who or which, or by that.

2. The source sentence was then embedded in the consumer sentence right after the NP that was the same in both sentences.

The result of this operation may be symbolized in this way:

$$\left.\begin{array}{l} \ldots NP_1 \ldots \\ NP_2 \quad Aux + Be + Pr \end{array}\right\} \Rightarrow \ldots NP + \left\{\begin{array}{c} \text{who or which} \\ \text{that} \end{array}\right\} + Aux + Be + Pr$$

What we have talked about so far is only the first step in the double-base transformation of embedding a Be sentence. What else can be done? Let's look once more at the transformed sentences of our first example.

1. The milkmaid carried the pail. / The pail was empty. } ⇒ The milkmaid carried the pail which was empty.

2. I live in the house. / The house is red. } ⇒ I live in the house which is red.

3. He visited Steve. / Steve is friendly. } ⇒ He visited Steve who is friendly.

4. The cat hissed. / The cat is angry. } ⇒ The cat which is angry hissed.

5. The bicycle cost fifty dollars. / The bicycle is fast. } ⇒ The bicycle which is fast cost fifty dollars.

6. The teacher assigned a theme. / The teacher is helpful. } ⇒ The teacher who is helpful assigned a theme.

Would it be possible to delete some words from these transformed sentences without changing the meaning? Would the following be possible?

The milkmaid carried the pail which was empty. ⟹

The milkmaid carried the empty pail.

Try to rewrite the transformed sentences above by deleting some words. What part of the source sentence remains embedded in the new sentences you have written? What kind of Pr's did you find in the source sentences? When you wrote your new sentences where did you place the adjective Pr's. It should now be possible for you to see how the adjectives you use in your everyday sentences came into those sentences. Adjectives come from source Be sentences which are embedded in other sentences.

Exercise 5:
Copy the following sentences on your paper. 1) Write a transform in which you embed the source sentence into the consumer. (Remember what you have to change in the source sentence before you can embed it.) 2) Write a second transform for each in which you delete all of the embedded source except the adjective Pr. (Where will the adjective be placed in the new transform?)

A. 1. Jane caught a butterfly.
The butterfly was a Monarch.

2. I am reading a book.
The book is exciting.

3. The author lost the package.
The package was valuable.

4. Ink ran on the rug.
The ink is indelible.

5. The president was Franklin Roosevelt.
The president was lame.

6. Father has the tickets.
The tickets are yellow.

7. The class will graduate tomorrow.
The class is large.

8. Frannie had crawled into the cave.
The cave was dark.

B. 1. He threw the wastebasket at the door.
The wastebasket was empty.

2. Jack climbed the stairs quietly.
The stairs were steep.

3. You will be taking the course.
The course is difficult.

4. Frenchy had seen the moon.
The moon was new.

5. The crackers taste strange.
The crackers are stale.

6. The officers will plan the party.
The officers are experienced.

7. I have been seeing the dentist every week.
The dentist is cheerful.

8. He threw the wastebasket at the door.
The door was open.

Now look at the following sentences:

CONSUMER: The boy is big.
SOURCE: The boy is outside.

CONSUMER: The man hires teenagers.
SOURCE: The man is at home.

CONSUMER: I have the book.
SOURCE: The book is inside.

CONSUMER: I own the car.
SOURCE: The car is under the carport.

What kind of Pr's do we find in every one of the source sentences above?

On your paper write the transforms which result from embedding the above source sentences in their consumer sentences.

Next try to delete all the words of the embedded source except the Pr.

Can we say "The boy outside is big"?

Can the other adverb Pr's be embedded in the same way?

In this operation where must the adverb Pr appear in the transformed sentence?

Could we say "The outside boy is big"?

Exercise 6:
Copy the following pairs of sentences, and transform them in two ways. 1) Embed the source in the consumer, first changing the NP to who, which, or that. 2) Delete all the source except the adverb Pr.

Example: The ship will sail tomorrow.
The ship is in the harbor.

The ship will sail tomorrow
The ship is in the harbor. } ⇒

The ship which is in the harbor will sail tomorrow

The ship in the harbor will sail tomorrow.

1. The coat fits Mary.
   The coat is in the closet.

2. The alligator needs food.
   The alligator is in the bathtub.

3. We visited the shops.
   The shops are uptown.

4. The girl lost her shoe.
   The girl is in front.

5. The city sprayed the trees.
   The trees are in the park.

6. The soup smells good.
   The soup is on the stove.

7. Nancy drew the picture.
   The picture is on the board.

8. The party starts at nine.
   The party is on the patio.

9. The book concerns history.
   The book is on the table.

10. He attends the junior high.
    The junior high is on the hill.

We have found that we can embed Pr's which are adjectives and Pr's which are adverbs in the consumer sentence. What is the third kind of Pr? Let's look at some sentences with this kind.

The truck runs badly.
The truck is a jeep. } ⇒

We bought the house.
The house is a mansion. } ⇒

The man seems happy.
The man is an artist. } ⇒

The girl went with the team.
The girl is a cheerleader. } ⇒

The book has been lost.
The book is a biography. } ⇒

Copy the pairs of sentences above and embed the Be source sentence in the consumer sentence, writing your Transform to the right of the double arrow. What change must you make in the source before embedding it?

Now try to delete all of the words of the source sentence except the Pr in this way:

The man who is an artist seems happy ⇒ The man, an artist, seems happy.

Do other sentences in the same way. What kind of Pr's do these sentences have? Where do they go in the Transform? Could they go before the NP of the consumer sentence? Can we say

The artist man seems happy.

or

We bought the mansion house. ?

Exercise 7:
Copy the following pairs of sentences and perform the two kinds of Beembedding. That is, first embed the entire source sentence. Then delete all of the source except the Pr.

Example: John went to the meeting.
John is the boatswain. } ⇒

John who is the boatswain went to the meeting. ⇒

John, the boatswain, went to the meeting.

1. George is building the house.
   George is a carpenter.

2. The girl will help.
   The girl is a secretary.

3. I invited the man to dinner.
   The man is a sergeant.

4. He chased the animal around the room.
   The animal is a hamster.

5. We had planted the shrubs.
   The shrubs are rhododendrons.

6. His father set the bone.
   His father is a doctor.

7. The boat won the race last year.
   The boat is a schooner.

8. The play is selling out every night.
   The play is a melodrama.

9. The museum bought the picture.
   The picture is a Rembrandt.

10. The fault will cause him trouble.
    The fault is lying.

We have now seen that there are two kinds of Transforms which can result from embedding Be sentences in consumer sentences. First, the entire Be sentence can be embedded. Second, all of the words of source except the Pr can be deleted. We found that all three kinds of Pr's can be embedded in this way.

The milkmaid carried the pail which was empty. ⇒

The milkmaid carried the empty pail. (Adj)

The boy who is outside is big. ⟹ The boy outside is big. (Loc)

The truck which is a jeep runs badly. ⟹

The truck, a jeep, runs badly. (NP)

Is there anything different about the position of the three Pr's in the Transform? Obviously the Pr's which are adjectives are placed before the NP and the other two kinds of Pr's are placed after the NP. It is important to note that when the result is a sentence like "The man, a father, seems happy." we write it with commas around the NP, the only piece of the source sentence that now remains. These commas correspond to the slight hesitation that surrounds "the father" in speech. (Sometimes this kind of NP is called an appositive.)

Can we now symbolize what happens in the second kind of embedding, when only the Pr is left in the result sentence?

Remember that we symbolized the first step in this way:

$$\left.\begin{matrix}\ldots NP_1 \ldots \\ NP_2 + Aux + Be + Pr\end{matrix}\right\} \Longrightarrow \ldots NP_1 + \left\{\begin{matrix}\text{who or which} \\ \text{that}\end{matrix}\right\} + Aux + Be + Pr$$

Let us symbolize the result in the second step in this way:

$$\ldots NP + \left\{\begin{matrix}\text{who or which} \\ \text{that}\end{matrix}\right\} + Aux + Be + Pr \ldots \Longrightarrow \ldots NP + Pr \ldots$$

Does this take care of all the Pr's that we embedded in consumer sentences? Which one wouldn't be accurately described by this group of symbols? Why? Because we place the adjective Pr's before the NP, instead of after the NP, we will have to say that if Pr= Adj, then there must be one more step. This is necessary so that we won't produce nonsentences like "The milkmaid beautiful carried the pail."

How do we symbolize this last step? Remember that any NP---> T+ N+ N°. Therefore the symbol string for "The milkmaid carried the pail is:

$$T + N + N^o + past + Vtr + T + N + N^o$$

The milkmaid carried the pail.

Where is the adjective Pr beautiful placed when it is embedded in this sentence?

$$T + Adj + N + N^o + past + Vtr + T + N + N^o$$

The beautiful milkmaid carried the pail.

Therefore we symbolize this final step in this way:

$$\ldots T + N + N^{o} + Adj \Rightarrow \ldots T + Adj + N + N^{o}$$

Exercise 8:
Copy the following sentences and perform two kinds of Be embedding. First embed the entire source sentence, remembering to change the subject to who, which, or that. Then delete all but the Pr. Finally indicate whether the Pr is Adj., Adv., or NP. Remember that if a Pr is an Adj it must also go through a third step so that it will appear in its grammatical position in the sentence.

Example:

He has found a mouse.
The mouse is spotted. $\Rightarrow$

He has found a mouse which is spotted. $\Rightarrow$

He has found a mouse spotted. $\Rightarrow$

He has found a spotted mouse. (Adj.)

1. The cat purred happily.
   The cat is black.

2. Jasper solved the problem.
   Jasper is a genius.

3. South High lost the game.
   South High is the champion.

4. The boy had the mumps.
   The boy was absent.

5. The bagpipers wore kilts.
   The bagpipers were here.

6. We painted the bench.
   The bench is in the garden.

7. We heard the sirens.
   The sirens are loud.

8. The walls tumbled down.
   The walls were weak.

9. The boy shouted gleefully.
   The boy was happy.

10. My love gave a partridge.
    The partridge is in a pear tree.

In doing the preceding exercise remember two things:

1. When we use who or which (or that) to replace the NP in the first step, who is used to replace a Nhum and which to replace a Nnon. That can replace either.

2. A Pr which is an NP is set off by commas when it is embedded in the consumer in the second step.

EMBEDDING HAVE SENTENCES

There are many kinds of embedding transformations. Maybe by now you have begun to see how many possibilities there are for combining, or transforming, kernel sentences to make other more interesting sentences. We have just looked at one of the simple kinds of embedding transformations. We will consider only one more kind at this time. This one will embed have sentences into consumer kernels. Look at the following pair of sentences.

CONSUMER: The cold is bad.
SOURCE: The boy has a cold.

Can we embed the source sentence of this pair in the consumer sentence in the same way that we embedded Be sentences in other kernels? For instance, would you say

The cold which had a cold is bad?

This is obviously not a sentence which any speaker of English would use. But, is it possible to say

The cold which the boy has is bad. ?

This is a sentence of English. It is the result of embedding "The boy has a cold." in "The cold is bad." Can you see how this came about? Let us look at a few more examples.

CONSUMER: The hardtop is green.
SOURCE: The car has a hardtop.
TRANSFORM: The hardtop which the car has is green.

CONSUMER: The assignment seems long.
SOURCE: The student has an assignment.
TRANSFORM: The assignment which the student has seems long.

CONSUMER: Tom called the friend.
SOURCE: The girl has a friend.
TRANSFORM: Tom called the friend whom the girl has.

CONSUMER: Mary knows the secret.
SOURCE: The boy has the secret.
TRANSFORM: Mary knows the secret which the boy has.

CONSUMER: Rod wrote the song.
SOURCE: The school has a song.
TRANSFORM: Rod wrote the song which the school has.

In each of the groups you probably noticed that there is a noun phrase in the source sentence which is like a noun phrase in the consumer sentence. Copy these groups of sentences above and draw circles around the nouns that are alike in each group.

Now look at the transforms in each group. In each transform underline the part that was the consumer sentence. The part that is left is the embedded source sentence. What part of the original source sentence remains in each case? What word has been replaced? Obviously the NP^2 of each source sentence has been replaced by which or whom (that would also do). "Hardtop" is replaced in the first, assignment in the second, friend in the third, etc.

You probably remember why we are using whom in this step instead of who. When we were talking about question transformations in which we replaced the object (NP^2) we said that in standard English we use the form whom to replace the object word in a sentence just as we use the form who to replace the subject word. (In "The girl has a friend." friend is the object NP^2. Since that is the word we replace, we will use whom.) We use whom to replace Nhum and which to replace Nnon.

But where is the replacement located in the result sentence? In every case the which or who was moved to the front of the source sentence and then the whole source was placed right after the NP of the consumer.

Exercise 1:
Copy the following have sentences leaving two spaces after each. Rewrite each sentence replacing the NP^2 with whom, which or that. Be able to explain why you made the choice you did. Rewrite the sentence a second time, moving the whom, which or that ahead of the subject NP.

Example: The boy has a ball. $\Longrightarrow$

The boy has which $\Longrightarrow$

which the boy has

1. The announcer has the script.
2. The cat has whiskers.
3. A man has a home.

4. The boy has a father.
5. The team has the trophy.
6. I have a friend.
7. The boat has a sail.
8. The class has a captain.
9. Jeanette has a doctor.
10. Cindy has a smile.

Now let's write the linguistic strings for have sentences and for consumer sentences involved in this embedding process and finally for the Transform which results from embedding one in the other.

The have source sentences can be represented in this way:

SOURCE: $NP^1 + Aux + have + NP^2$

When we use symbols to represent the consumer sentences all we care about is the noun phrase which is like NP^2 of the source sentence, because that is all that is involved in this transformation. We don't care what comes before it or what follows it. So we can indicate it in this way:

CONSUMER: ...NP...

We found that the who, which or that moved to the front of the source sentence before it was embedded and then the whole source was placed right after the NP of the consumer.

The hardtop the car has which is green.

Therefore we can use the following linguistic symbols to show the result of this embedding of have sentences: (We will use NP^s to indicate the subject NP of the embedded source.)

SOURCE: $NP^1 + Aux + have + NP^2$ } ⟹
CONSUMER: ...NP...

TRANSFORM:. ...NP + {whom or which / that} + NP^s + Aux + have..

Exercise 2:
Embed the have sentences of the following pairs into the consumer sentences. Remember that you must first replace the NP^2 of the have sentence with whom, which, or that and place it in front of NP^s before you can embed the sentence.

Example: I borrowed the book. / Tom has a book. } ⟹

I borrowed the book which Tom has.

A. 1. He got the part.
I have the part. ⇒

2. That job was excellent.
The man has the job. ⇒

3. The trouble was annoying.
The teacher had trouble. ⇒

4. Nobody likes the sister.
The boys have a sister. ⇒

5. The daughter is in Athens.
The president has a daughter. ⇒

6. We will go to the party.
Mary has a party. ⇒

7. We have called the doctor.
The company has a doctor. ⇒

8. The father met the teacher.
The boy has a teacher. ⇒

B. 1. The class will be doing the assignment.
They have an assignment. ⇒

2. Jeremy has lost the combination.
He has a combination. ⇒

3. We like the friend.
Mary has a friend. ⇒

4. The shoes hurt.
Fred has the shoes. ⇒

5. The gardener had stolen the money.
The Moores have a gardener. ⇒

6. The bat had a gallstone.
John had a bat. ⇒

7. He wrecked the car.
Father has a car. ⇒

8. We had recognized the twin.
Paul has a twin. ⇒

When we embedded Be sentences, we discovered that it was possible to make a second transformation.

The boy is the oldest
The boy is tall } ⇒

The boy who is tall is the oldest ⇒

The tall boy is the oldest.

We might want to ask if there is a second transformation possible when we embed with have sources. In the Be embedding, the second transform shortened the source sentence. Let's see if we can do the same thing with have sources. We will use the examples we used before. Is it possible to do the following?

The hardtop which the car has is green. ⇒
The hardtop the car has is green.

The assignment which the student has seems long. ⇒
The assignment the student has seems long.

Tom called the friend whom the girl has. ⇒
Tom called the friend the girl has.

Mary knows the secret which the boy has. ⇒
Mary knows the secret the boy has.

Rod wrote the song which the school has. ⇒
Tom wrote the song the school has.

What has been eliminated in each of these transformations?

Let us express this transformation in linguistic symbols. We started with the Transform which was the result of embedding a have sentence and eliminated the whom, which, or that.

$$\ldots NP + \left\{\begin{matrix}\text{whom or which}\\ \text{that}\end{matrix}\right\} + NP^{S} + Aux + have \ldots \Longrightarrow$$

$$\ldots NP + NP^{S} + Aux + have \ldots$$

Exercise 3:
Copy the following pairs of sentences. Perform the two kinds of have embedding. That is, first embed the entire source sentence and then rewrite it, eliminating the whom, which or that.

Example: We found the billfold
Frank has a billfold. } ⇒

We found the billfold which Frank has. ⇒

We found the billfold Frank has.

A. 1. Ned hit the rooster.
The farmer has a rooster.

2. The wallet must have fallen in the lake.
Gordon has a wallet.

3. The plane is landing in Portland.
The president has a plane.

4. The quarterback carried the ball.
South has a quarterback.

5. The aunt is an actress .
Georgia has an aunt.

6. The subscription will expire.
I have a subscription.

B. The following sentences are the results of having gone through the two transformations of have embedding. Try to write first the transformed sentence that immediately preceded each and then the two kernel sentences from which the two derived.

Example:

The company designed the trumpet the boy has.
from
The company designed the trumpet which the boy has.
from
The company designed the trumpet.
The boy has a trumpet.

1. The dog buried the bone the cook has.
2. The propellor the plane has fell off.
3. The mouse John has was spotted.
4. The glasses thc man has are on his nose.
5. The agent the actor has will come tomorrow.
6. The shell the turtle has is exterior.

There is one more step in the transformation of this kind of sentence. Is there a close relationship between the following pairs?

The job the man had was excellent.
The man's job was excellent.

The hardtop the car has is green.
The car's hardtop is green.

The assignment the student has seems long.
The student's assignment seems long.

Tom called the friend whom the girl has.
Tom called the girl's friend.

Mary knows the secret the boy has.
Mary knows the boy's secret.

Rod wrote the song the school has.
Rod wrote the school's song.

What changes have taken place in the first sentence of each pair to produce the 2nd? In every case three things happened.

1. All but the $\underline{NP^s}$ of the embedded source was cut out.
2. The $\underline{NP^s}$ became the $\underline{T}$ of the $\underline{NP}$ in the consumer sentence.
3. The $\underline{NP^s}$ also changed its form. (boy $\Rightarrow$ boy's)

Mary knows the secret the boy has. $\Longrightarrow$

Mary knows the boy's secret.

We call the form of nouns in this last step the possessive form. It is usually formed by adding an s sound. There are several things to remember here.

1. If the possessive noun is singular (like boy, man, car, etc.) it is written by placing an apostrophe between the noun and the s. (boy's, man's, car's)
2. If the noun is plural the apostrophe is placed after the s sound of the plural noun. (boys', cars', houses').

What happens if we have a plural noun without an s ending (men, children, sheep)? In this case we add the apostrophe after the plural form and then add an s to give the word the s sound of the possessive form (men's, children's, sheep's).

Can we symbolize this possessive transformation? We found that the possessive form of the NP of the source replaces the T of the NP of the consumer. The possessive form has 's.

The job the man has is excellent. $\Longrightarrow$

The man's job is excellent.

If we write the NP of the consumer as T + N + N^o we can show what happens.

$$\ldots T + N + N^o + N \quad \text{Aux} + \text{have} \ldots \Longrightarrow$$

$$\ldots NP^s + s + N + N^o \ldots$$

Exercise 4:
A. Copy the following nouns and try to write their plural forms. In case of doubt consult your dictionary.

man	book	trainer
woman	fish	voter
child	fox	mink
car	baby	butterfly
dog	grandfather	cook
tree	uncle	typist
teacher	terrier	slder
singer	mouse	louse
mailman	star	pony

B. Write the possessive form for both the singular and the plural nouns in A.

In phrase structure Rule (13) we said that pronouns such as I, he, you, etc., were forms of nouns. Therefore we might expect to have pronouns in some of our NP positions. In the sentence "The assignment he has seems long. He is the embedded NP^1 of the source sentence "He has the assignment." If we want to eliminate the rest of the words of the source sentence and make he possessive, what form will it take? We couldn't say "He assignment seems long." But we could say "His assignment seems long." All the pronouns have a special form to show possession.

I becomes my
she becomes her
he becomes ___?___
it becomes ___?___
we becomes ___?___
you becomes ___?___
they becomes ___?___

Now let's put together all of the operations involved in embedding have sentences and write a final rule. We begin with two sentences, a consumer and a have sentence which is the source.

$$\begin{matrix} \ldots NP \ldots \\ NP + Aux + have + NP^2 \end{matrix}$$

The NP^2 of the source is changed to whom, which, or that and the source sentence is embedded in the consumer. (What happens to the position of the whom, which or that?)

$$\ldots NP + \left\{ \begin{matrix} \text{whom or which} \\ \text{that} \end{matrix} \right\} + NP^s + Aux + have + \ldots$$

Then the whom , which or that is eliminated.

$$\ldots T + N + N^o + NP^s + Aux + have \ldots$$

The final step is to write the NP of the consumer as $T + N + N^o$. Then the NP of the source becomes the T, adds the sign of the possessive, and the rest of the source is deleted, leaving

$$\ldots NP^s + s + N + N^o \ldots$$

The rule, then, will look like this:

$$\left.\begin{matrix}\ldots NP\ldots \\ NP + Aux + have + NP^2\end{matrix}\right\} \Longrightarrow$$

$$\ldots NP + \left\{\begin{matrix}\text{whom or which} \\ \text{that}\end{matrix}\right\} + NP^s + Aux + have + \ldots \Longrightarrow$$

$$\ldots T + N + N^o + NP^s + Aux + have + \ldots \Longrightarrow$$

$$\ldots NP^s + s + N + N^o \ldots$$

Remember that the form of the $NP^s + s$ will depend on whether the NP is a pronoun or not, and whether it is singular or plural.

Exercise 5:
A. Copy the following pairs of sentences. Carry them through the three operations of embedding a have sentence so that you end up with the possessive form.

Example: James carried the books.
The girl has the books. $\Longrightarrow$

James carried the books which the girl has. $\Longrightarrow$

James carried the books the girl has. $\Longrightarrow$

James carried the girl's books.

1. The phone book is large.
   Eugene has a phone book.

2. The lunchroom is crowded.
   Roosevelt School has a lunchroom.

3. The gun shoots accurately.
   The man has a gun.

4. They learned the motto.
   The Girl Scouts have a motto.

5. We admire the teacher.
   We have a teacher.

6. Mary rode the horse.
   Jack has a horse.

7. Thieves stole the tricycle.
   The child has a tricycle.

8. The sprain was severe.
   The halfback has a sprain.

9. The man saw the fish.
   The bear has a fish.

10. The party lasted three hours.
    The class had a party.

B. Write the underlying sentences for the following. That is, trace each one back to the original kernel sentences.

Example: The boy's tooth was aching.

from

The tooth the boy has was aching.

from

The tooth which the boy has was aching.

from

The tooth was aching.
The boy has a tooth.

1. The car's top is black.
2. The boy found the chipmunk's nest in the tree.
3. The student's record is excellent.
4. Ted has brought the cat's cage.
5. He accepted his responsibility reluctantly.
6. The pupils admired their teacher.
7. The cheerleaders' uniforms will be arriving tomorrow.
8. I must have been puzzling my friends.
9. George's costume will be hilarious.
10. Bill has been visiting Jane's cousin.

C. Write the linguistic string for the sentences in B above.

Example: $NP^s + s + N + sing + past + be + ing + VI$

The boy's tooth was aching

D. Write the linguistic strings for the kernel sentences and the three transforms for numbers 1, 3, 5, 7, and 9 of A.

Example:

. . . NP . . .

James carried the books.

$Np + Aux + have + NP^2$

The girl has the books.

. . . NP + which + NP^s + Aux + have.

James carried the books which the girl has

. . . T + N + N^o + NP^s + Aux + have

James carried the books the girl has

. . . NP^s + s + N + N^o

James carried the girl's books

Remember:

1. The possessive in English sentences is the result of the following process.

   a. A sentence of the form NP + Aux + have + NP^2 is embedded in another sentence which has an NP identical to the NP^2 of the source.

      The ball is red.
      The baby has a ball. ⟹

   b. When the source is embedded the NP^2 is replaced by who or which (or that) and moves to the front.

      The ball which the baby has is red.

   c. All of the source except the NP is deleted; an 's is added; and the NP becomes the determiner of the NP of the consumer.

      The baby's ball is red.

2. The possessive form of nouns has 's.

3. Personal pronouns have special forms for the possessive.